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VOLUME EIGHTEEN

MAY, 1937

NUMBER THREE

Depreciation for Income Tax Purposes

A Discussion of Recent Developments in Treasury Practice

By MICHAEL OCHIS

(*New York Office*)

Under the various Revenue Acts, a taxpayer was and is entitled to

"a reasonable allowance for the exhaustion, wear and tear of property used in the trade or business, including a reasonable allowance for obsolescence."

This fact has not been changed by the promulgation of Treasury Decision 4422 and the issuance of Mimeograph 4170. The prior Treasury Regulations and practices already provided for the application of substantially the same principles covered by T. D. 4422 and Mim. 4170; namely, placing the burden of proof on the taxpayer, the furnishing by the taxpayer of the essential data pertaining to its plant and depreciation accounts, the application of the allowed or allowable depreciation for prior years, the spreading of the recoverable balance over the remaining useful life of the assets, etc. It is true that they were infrequently applied and their appli-

cation was primarily left to the discretion or initiative of the examining revenue agents, who also frequently prepared the depreciation schedules.

T. D. 4422 and Mim. 4170 made compulsory the application of these practices, made the taxpayer responsible for the preparation of the requisite schedules and placed the burden of proof squarely on the taxpayer. In permitting depreciation accounting based on averages, Mim. 4170 did introduce a new conception in regard to the accounting for retirements of property.

Supplemental to T. D. 4422 and Mim. 4170 the Valuation Division of the Treasury has developed or adopted various procedures for the determination of allowable depreciation. These determinations are predicated upon two guiding ideas:

1. The adoption whenever possible of the average rate of depreciation, coupled with the non-allowance of losses on retirements.

2. The reliance upon the ratio of the reserve account balance to the asset account balance to determine whether or not the depreciation rates allowed in the past have been excessive.

For an explanation of the theoretical foundations and validity of these ideas, the Treasury has on several occasions referred to:

1. The Straight-Line Depreciation Accounting Practice of Telephone Companies in the United States, by A. B. Crunden and D. R. Belcher; a paper presented to the International Congress on Accounting, New York, September 9-14, 1929 (Published in *Proceedings: International Congress on Accounting*, pages 351-386). Also published in *Bell Telephone Quarterly*, Volume VIII, page 259, 1929; and reprinted as a pamphlet.
2. Depreciation: A Review of Legal and Accounting Problems, by the Staff of the Public Service Commission of Wisconsin, chapters VIII and IX.

Average Depreciation Rate and Losses on Retirements

The Treasury maintains that taxpayers ordinarily use depreciation rates based upon the average lives of the depreciable assets. Therefore, losses on retirements are not allowable because

"The use of an average rate contemplates the normal retirement of assets both before and after the average life has been reached." (Mim. 4170.)

The Treasury maintains that the allowance of losses on retirements

in addition to the allowance of depreciation at the average rate would result in the taxpayer recovering all its investment by the end of the average life, but still deriving the benefits from the use of the fully depreciated plant assets that possess a useful life beyond the average life.

In actual practice there are numerous conditions under which the use of an average depreciation rate and the non-allowance of losses on retirements does not provide for the recovery of the capital sum over the useful life of the property. If losses are not to be allowed the depreciation rate should be a *composite* rate instead of an *average* rate. Average lives and average rates are frequently determined by the "dollar-years" method. The rate so determined on data comprising only a part of the life cycle of an account is inadequate during the early period of an account, or a rapidly growing account, to provide for the recovery of the capital sum over the useful life of the property. It is a complex problem to prove this fact for an account comprising thousands of items with varying lives, but the point may be illustrated simply.

Assume an account consisting of two items of equal cost but with lives of four and twelve years, respectively. The "dollar-years" method produces an average life of eight years, or an *average* de-

preciation rate of $12\frac{1}{2}$ per cent. To recover the cost over the useful life of each item necessitates a *composite* depreciation rate of $16\frac{2}{3}$ per cent.*

"Dollar-Years" method:

Cost	Life	Dollar Years
\$1,200	$\times 4$	= 4,800
1,200	$\times 12$	= 14,400
<u>\$2,400</u>		<u>19,200</u>

Average life 8 years
 Depreciation rate..... $12\frac{1}{2}\%$
 Annual depreciation \$300

Composite rate method:

Cost	Life	Annual Depreciation
\$1,200	$\div 4$	= \$300
1,200	$\div 12$	= 100
<u>\$2,400</u>		<u>\$400</u>

Depreciation rate $16\frac{2}{3}\%$

Proof:

	DEPRECIATION FOR			
	12 Year Item	4 Year Item	Replacement of 4 Year Item	Total Annual Depreciation
First Year.....	\$100	\$300	....	\$400
Second Year.....	100	300	....	400
Third Year.....	100	300	....	400
Fourth Year.....	100	300	....	400
Fifth Year.....	100	...	\$300	400
Etc.				

By the end of the fifth year, the cost of the 4-year item should be entirely recovered and the reserve against the 12-year item and the replacement 4-year item should be equal to the exhausted portions of

* For simplification it is assumed in all illustrations in the article that no net salvage exists. Adjustment for net salvage may easily be made by reducing the depreciation rate by the same ratio that the net salvage bears to the asset cost.

their service lives (5 and 1 years, respectively)—a reserve of \$800. Under the composite rate of $16\frac{2}{3}$ per cent. the reserve (after charging thereto the retirement of the 4-year item) would be \$800. Under the average rate of $12\frac{1}{2}$ per cent. the reserve would be \$300, a shortage of \$500. If the 4-year item is not replaced by another 4-year item, the depreciation rate for the first 4 years would still be $16\frac{2}{3}$ per cent.; a revised rate being called for beginning with the fifth year.

It is true, of course, that as the account gets older and more of the short life components are reflected, the "dollar-years" average rate approaches the composite rate. In this example, the average rate determined with two 4-year life components and one 12-year life component would be 15 per cent. At the time of the completion of the life cycle of one 12-year item and three 4-year items, the rate so determined would be $16\frac{2}{3}$ per cent.:

Cost	Life	Dollar Years
\$1,200	$\times 4$	= 4,800
1,200	$\times 4$	= 4,800
1,200	$\times 4$	= 4,800
1,200	$\times 12$	= 14,400
<u>\$4,800</u>		<u>28,800</u>

Average life: 6 years
 Depreciation rate: $16\frac{2}{3}\%$

The rate is correct, *not* because of the method, *but because* the data

for its determination include all the components of a complete life cycle.

Although the determination of a composite rate, as above, cannot be applied literally to a highly complex account, the existence of the average rate defect is apparent and depreciation rates more in harmony with the facts of the account may be determined.

Allowable losses on retirements:

Loss upon retirement of an asset is allowable

"in single item accounts or in classified accounts where it is the consistent practice of the taxpayer to base the rate of depreciation on the expected life of the longest-lived asset contained in the account." (Mim. 4170)

Single item accounts exist where the taxpayer possesses only one unit of the asset, as for instance, one gas producer, one blast furnace, etc. Keeping an individual card record and an individual depreciation computation for each piece of equipment does not meet this requirement where the depreciation rate for similar units is based on the average lives of such units. This is a question of real importance, for the Treasury's conception of whether or not losses are to be allowed on the normal retirement of assets does not depend on the kind of accounts that are kept, but on whether or not the depreciation rate is based on average lives or on maximum lives.

For example, if past experience has shown that lathes of like nature possess a useful life of from 15 to 25 years, the individual depreciation of a number of lathes of like nature over the average life of 20 years would not permit the deduction of losses. Loss on retirements would be allowable if the lathes are depreciated over the maximum life of 25 years.

The allowance of losses where the rate of depreciation is based on the expected life of the longest-lived asset contained in the account also requires qualification. For example, consider the cumulated allowances for a \$100,000 account consisting of the following components:

Years of life	Amount
25	\$10,000
20	10,000
15	15,000
12	24,000
10	25,000
8	16,000
	<u>\$100,000</u>

It is assumed that replacements are made as the shorter-lived units are retired.

In the table on the next page, the first column shows the cumulated depreciation at 4 per cent. (based on the longest-lived component) plus the allowance of losses. The second column shows the cumulated depreciation determined by actually depreciating each component over its useful life.

End of Year	CUMULATED ALLOWANCES		
	Depreciation at 4 per cent. (maximum life), Plus Losses on Retirements	Depreciation Computed by Depreciating Each Com- ponent Over Its Useful Life	Cumulated Deficiency of Maximum Life Basis
1.....	\$4,000	\$8,400	\$4,400
2.....	8,000	16,800	8,800
3.....	12,000	25,200	13,200
4.....	16,000	33,600	17,600
5.....	20,000	42,000	22,000
6.....	24,000	50,400	26,400
7.....	28,000	58,800	30,800
8.....	42,880	67,200	24,320
9.....	46,880	75,600	28,720
10.....	65,880	84,000	18,120
11.....	69,880	92,400	22,520
12.....	86,360	100,800	14,440
13.....	90,360	109,200	18,840
14.....	94,360	117,600	23,240
15.....	104,360	126,000	21,640
16.....	119,240	134,400	15,160
17.....	123,240	142,800	19,560
18.....	127,240	151,200	23,960
19.....	131,240	159,600	28,360
20.....	152,240	168,000	15,760
21.....	156,240	176,400	20,160
22.....	160,240	184,800	24,560
23.....	164,240	193,200	28,960
24.....	187,600	201,600	14,000
25.....	191,600	210,000	18,400

The use of a 4 per cent. depreciation rate and the allowance of losses on retirements would not result in the recovery of the capital sum over the useful life of the property during the early years of the account; or, the early years of the additions causing growth in an account.

Losses on retirements are allowable under certain conditions as provided by Mim. 4170:

"Where the taxpayer by clear and convincing evidence shows that assets are disposed of before the expiration of the normal expected life thereof, as, for example, because of casualty, obsolescence other than normal, or sale, losses on the retirement of such assets may be allowed, but only where it is clearly evident that such disposition was not contemplated in the rate of depreciation." (Italics supplied.)

Of course, the burden of proof

is on the taxpayer, but the Treasury has generally administered this provision fairly.

Average Life

For the determination of the average life, the Treasury naturally prefers the retirement experience of the taxpayers. In the absence of the actual retirement experience, the Treasury has devised various methods of determining depreciation rates, which methods are applicable in certain cases; or, reference is had to the experience of other taxpayers with similar equipment under reasonably similar usage.

The first four columns of the suggested form of schedule that accompanied Mim. 4170, or the subsequently suggested fourteen column form (and frequently referred to as "schedules under T. D. 4422"), provide a means of obtaining the essential retirement experience data of the taxpayer for the Treasury's purposes.

Several of the technics based upon retirement experience will be commented on. It is important to note that each one is based upon certain types and relationships of data. Even if the premises of each technic are correct, each is theoretically limited in its application to accounts, the data of which fall within these limits. In so far as the data do not fall within the theoretical bases of the technic, the

technic is not capable of being applied to an account. Its application to an account, the data of which do not fall within its theoretical bases, cannot, except by coincidence, result in a reasonable allowance for depreciation. *In short, each technic is a complex problem and it cannot be applied indiscriminately to any account at any point in the account's life history.*

Ratio of Retirements to Investment:

Under this technic the Treasury determines a depreciation rate as follows:

1. The ratio of average retirements to average investment in the account is determined. In a non-growing account, this ratio is also the depreciation rate. In a growing account, the depreciation rate is greater than the retirement ratio, and correction for the factor of growth is necessary.
2. The account balance for the latest available year is divided by the account balance for the first available year, and the quotient represents the "times" growth for the period. This quotient is translated to a compound annual rate of growth by reference to a compound interest table. For example, if the balance of \$440,000 of an account at the end of a 20-year period is divided by the beginning balance of \$200,000, the quotient is 2.2. By referring to the 20-year line of a compound interest table, it will be seen that the nearest number is 2.19112814 in the 4 per cent. column. The annual rate of growth for the ac-

count during the 20-year period was approximately 4 per cent.

3. Then by reference to mathematical formulae (or graph curves) which relate the retirement ratio to the growth ratio, the applicable depreciation rate is ascertained.

The depreciation rate so determined may be inadequate for numerous years because of the defect in the averaging method already mentioned, and which will be commented on again. In addition the adequacy of a depreciation rate so determined may be affected by several other factors with respect to both the retirement ratio and the rate of growth. For example:

1. If, in determining the average retirement ratio, all the investment in the account during the period is used, the retirement ratio is inadequate because the recent additions to the account, on which adequate depreciation should be accruing, are not yet represented, or but slightly represented, in the retirements. The greater the rate of growth, or the more recent the growth of the account, the greater the inadequacy of the retirement ratio.* The relating of the retirement ratio to growth ratio, as is done by the Treasury, only partly compensates for this factor of growth.
2. The mathematical formulae which relate this rate of growth to the retirement ratio (and the way the compound annual rate of growth

* Note similar criticisms of this method in "The Straight-Line Depreciation Accounting Practice of Telephone Companies in the United States," in *Proceedings: International Congress on Accounting*, pages 383-384.

is determined) presuppose an even growth of the account throughout the period. (A compound annual rate of growth, if plotted, is graphically a straight line.) Actual accounts generally do not increase on this basis. For instance, an account consisting of long-lived components may have a long period of little or no growth, followed by several years of rapid growth and then a fairly sharp decline. If the growth of such an account is determined on the basis of the most recent account balance, the rate of growth will be understated in so far as its use for the correction factor is concerned, and the ascertained rate of depreciation will be inadequate.

The retirement ratio results in a reasonably correct depreciation rate (exclusive of the averaging factor) in those instances where the comparison is made between the retirements from and the investment, or major portion of the investment, that has completed its life cycle. For example, consider the illustration already used of an account of two items of equal cost but with lives of four and twelve years, respectively. The complete life cycle is 12 years and during that period the 4-year item will have been replaced twice. Inasmuch as it is a non-growing account the retirement ratio may be read directly as the depreciation rate. The determination of the retirement ratio at various periods of elapsed life shows:

At end of	Cumulated Investment	Cumulated Retirements	Retirement Ratio, or Depreciation Rate
Fifth year.....	\$12,000	\$1,200	10.00%
Ninth year.....	21,600	2,400	11.11
Tenth year.....	24,000	2,400	10.00
Eleventh year....	26,400	2,400	9.09
Twelfth year.....	28,800	4,800	16.67
Seventeenth year..	40,800	6,000	14.71
Eighteenth year....	43,200	6,000	13.89
Nineteenth year...	45,600	6,000	13.16
Twentieth year....	48,000	7,200	15.00
Twenty-third year..	55,200	7,200	13.04
Twenty-fourth year.	57,600	9,600	16.67

The only points at which the correct depreciation rate is shown are at the end of the twelfth and twenty-fourth years, both being periods representing the completion of life cycles.

Again, the application of this technic to a highly complex account is a difficult process, but it can be and has been done.

Survival percentages: Under another technic, the Treasury from the data tabulated in "Schedules under T. D. 4422" determines the survival percentages at the end of each year after the addition of the plant assets. For example, consider an actual account:

Year	Gross Additions During Each Year	Unretired Costs at End of Year 1936	Survival Percentages
1914.....	\$ 553,648	.....	.....
1915.....	1,048,488	.....	.....
1916.....	739,321	.....	.....
1917.....	947,983	\$ 119	.....
1918.....	1,011,924	277	.....
1919.....	1,971,600	550,328	.279
1920.....	2,162,391	1,168,925	.541
1921.....	2,143,993	342,856	.160
1922.....	2,554,175	329,198	.129
1923.....	4,436,241	1,322,456	.298
1924.....	4,777,304	474,683	.099
1925.....	9,118,087	3,965,367	.435
1926.....	12,036,988	7,157,085	.595
1927.....	10,761,775	5,341,592	.496
1928.....	8,401,092	4,032,955	.480
1929.....	5,570,913	2,874,195	.516
1930.....	5,431,651	3,411,848	.628
1931.....	5,428,617	3,721,460	.686
1932.....	7,877,838	5,729,407	.727
1933.....	5,626,898	4,880,891	.867
1934.....	5,322,218	4,665,794	.877
1935.....	1,669,662	1,467,093	.879
1936.....	1,951,766	1,889,733	.968

The total of the survival percentages represents the average life of the assets or the account. The survival percentages may be plotted on graph paper, a life curve drawn thereon and an average life determined therefrom.

This procedure, inasmuch as it does not adequately reflect the peculiar variations in the retirement behavior of individual year's additions and does not weight the survival percentages for the money amounts, will determine the real average life only if the retirement behavior of each year's additions is substantially the same. (Note the money amounts and out-of-line behavior of the additions of the years 1919, 1920, 1923 and 1924 in the above table.) However, when refined to reflect these factors, the method does give a reasonably correct average life of the plant assets included in the account, in so far as the average life can be determined from past retirement experience.

Although the average life of several different accounts may be the same, the retirement experience (or mortality characteristics) may vary greatly. For example, consider the survival percentages (adapted from actual accounts) as set forth in the tabulation in the adjoining column, and as reflected in a set of curves in the chart appearing on page 10 which indicate generally the variance between these two factors.

Age (Years)*	Group A	Group B	Group C
1/2.....	1.00	.98	.96
1 1/2.....	.99	.94	.87
2 1/2.....	.98	.90	.80
3 1/2.....	.97	.85	.73
4 1/2.....	.95	.80	.66
5 1/2.....	.93	.75	.63
6 1/2.....	.90	.69	.58
7 1/2.....	.83	.62	.54
8 1/2.....	.70	.57	.50
9 1/2.....	.55	.52	.47
10 1/2.....	.40	.47	.43
11 1/2.....	.28	.41	.41
12 1/2.....	.17	.36	.39
13 1/2.....	.11	.31	.37
14 1/2.....	.08	.26	.34
15 1/2.....	.06	.20	.31
16 1/2.....	.04	.15	.27
17 1/2.....	.03	.10	.22
18 1/2.....	.02	.06	.18
19 1/2.....	.01	.03	.14
20 1/2.....	.00	.02	.10
21 1/2.....		.01	.07
22 1/2.....		.00	.03
23 1/2.....			.00
Average Life	10 years	10 years	10 years

The average life of these three accounts is the same, yet the retirement behavior varies greatly.

Group A. In this group, the bulk of the retirements (in money amounts) occur within a few years of the average life, with relatively few retirements in the early years of life and a very small portion lasting a few years beyond the average life. If the survival percentages are plotted on a chart, this type of account would result in Curve A.

Group B. In this group the retirements occur fairly regularly throughout the life cycle. The plotting of the survival percentages results in Curve B.

Group C. In this group the retirements occur heavily in the

* The usual custom of averaging the additions in the year acquired also results in only one-half year of expired life in the year of acquisition.

early years (that is, high infant mortality) and certain amounts last a long period beyond the average life. The plotting of the survival percentages results in Curve C.

Curve D. This curve is included in order to show the behavior pattern of an account with very high infant mortality, with some items possessing lives 4-6 times as great as the account average.

Although the average life in all three instances is the same and under the average life-group theory of depreciation accounting the depreciation rate would be the same, and although the application of such depreciation rate to the account balance (and charging the retirements to the reserve for depreciation) would result in the allowance of total accumulated depreciation equal to the total capital cost by the time of the last retirement—the fact remains that the depreciation allowances during the early years of the account, or of a growing account, would be inadequate. The inadequacy in a Group A account would be small, but the inadequacy becomes increasingly greater and of real importance the greater the rate of growth of the account and the nearer the life curve approaches Curve D. This inadequacy aspect will be considered further.

At certain stages in the history

of an account (usually after growth ceases and a substantial portion of the life cycle of its components has elapsed; and dependent on the rate of prior growth, the type of life curve, the amount, age and relation of the components to each other, etc.), the average depreciation rate provides "a reasonable depreciation allowance." But the rate may be reduced by the Treasury in accordance with its contention that excessive depreciation was allowed in prior years, such fact being presumed from the ratio of the reserve balance to the asset balance.

Ratio of Reserve Balance to Plant Account Balance:

The Treasury during recent years has placed considerable dependence on the ratio of the reserve balance to the corresponding plant account balance; and maintains that a depreciation reserve in excess of certain ratios, after giving due weight to the retirement experience, the age and the rate of growth of the account, proves that the depreciation allowed or taken in the past was excessive.

It is the Treasury's position that this reserve ratio should not as a rule exceed 50 per cent. of the asset account for a non-growing account, the retirements of which have no net salvage value. The reserve ratio should be less than 50 per cent. for growing accounts; and the

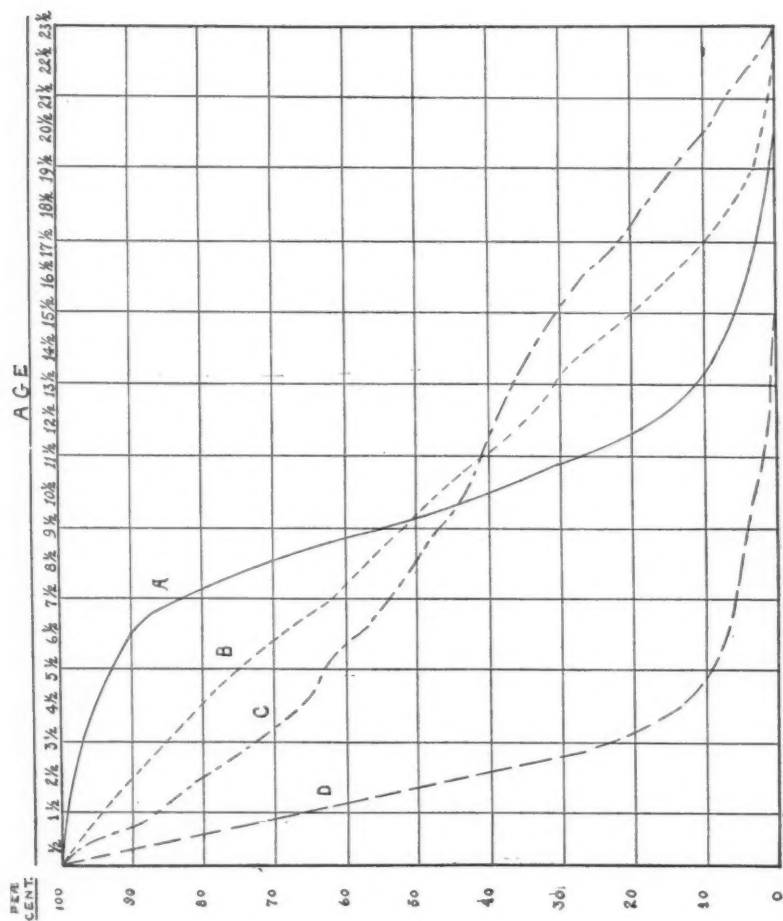


Chart to accompany tabulation on page 8.

greater the growth, the lesser the reserve ratio.

Of course, this applies only to accounts comprising many items and in which there are continual retirements and replacements, like machinery and equipment accounts. It does not apply to accounts in which there is a large initial investment and relatively few retirements until the termination of the useful life of the asset, at which time all or most of the investment is retired. Buildings, coke ovens, installation of a few large pieces of equipment, such as boilers, presses, etc., are examples.

However, even in the case of machinery or equipment accounts of many items with frequent retirements and replacements, a reserve ratio substantially above the 50 per cent. point may be necessary to permit the taxpayer to recover the capital sum over the useful life of the property. The reserve account reaches

"its maximum as a per cent. of the property to which it relates immediately before retirement of those components of the group which achieve the longest individual lives";*

and this ratio may be well in excess of 50 per cent.

The determination of the proper reserve ratio is a complex matter because

"for all groups of a homogeneous class taken together, the reserve account will exhibit a condition which is dependent upon the complex of the successive groups, upon their relative volume and upon their appearance and disappearance in time with respect to each other."**

The reserve ratio as a means of determining the adequacy of depreciation allowances suffers from the same averaging defect that the depreciation rate based on the average life suffers. True, the taxpayer will recover its capital sum by the time of retirement of the longest-lived component in the account. But, in the early years of the account, and more so in an account with a rapid rate of growth and/or a high infant mortality rate, the taxpayer will receive inadequate depreciation, such shortage being made up by the allowance for depreciation in the years beyond the average life.

The inadequacy of the reserve is caused by the fact that the group accrual of depreciation, based on the average life of the components, does not provide for the retirement of the short-lived components during their individual lives and at the same time provide for the accumulated depreciation for the then exhausted or expired life of the longer-lived components. The deficiency is made up by the accrual of depreciation, at the average rate,

* "The Straight-Line Depreciation Accounting Practice of Telephone Companies in the United States," in *Proceedings: International Congress on Accounting*, pages 381-382.

** Ibid., page 382.

on the longer-lived components to the end of their lives.*

This fact is admitted by the proponents of the group depreciation reserve method. For example, in the previously mentioned "Depreciation: A Review of Legal and Accounting Problems" by the Staff of the Public Service Commission of Wisconsin, an illustrative problem of the reserve ratio and the correct accumulated depreciation based upon the exhausted service life of the remaining components is given. On pages 193-194, it is stated:

"Thus, it is seen that while the reserve requirement in the case illustrated is 15.1 per cent., the exhaustion of service capacity of the plant remaining in service is 24.4 per cent.

"This latter percentage is based on the relation of average age of the plant in service to its total life. It is the true measure of the accrued depreciation in the plant based on the exhaustion of its service capacity. The reserve requirement of 15.1 is less than the accrued depreciation. Nevertheless, it is the correct amount of reserve under the group method of accruing depreciation expense. The difference between the reserve requirement and the exhaustion of service capacity is due to the averaging process inherent in the group plan of straight-line depreciation accounting. Under this procedure, the deficiency in accruals on the plant retired at less

than its average life reduces the reserve and causes it to be less than the exhaustion of service capacity of the plant in service." (Italics supplied.)

A comparison is given below of the reserve ratio computed at the average rate and at the exhausted service life for Group C account, supra, assuming no growth but a stationary balance, replacement of retirements, the replacements possessing the same life curve as the original additions, and charging of the retirements to the reserve. Depreciation is computed at one-half the annual rate for the year of acquisition.

GROUP C ACCOUNT
RATIO OF RESERVE TO ASSET ACCOUNT

Year	Reserve Computed at Average Rate of 10 per cent.	Reserve Computed by Depreciating Each Component Over its Useful Life	Deficiency of Average Rate Method
1.....	.8%	11.7%	10.9%
2.....	1.1	22.0	20.9
3.....	2.6	28.6	26.0
4.....	3.5	32.6	29.1
5.....	3.7	34.7	31.0
6.....	7.5	39.4	31.9
7.....	9.2	41.5	32.3
8.....	11.5	43.8	32.3
9.....	13.5	45.6	32.1
10.....	16.3	47.9	31.6
11.....	17.8	48.8	31.0
12.....	21.2	51.2	30.0
13.....	24.5	53.4	28.9
14.....	27.7	55.5	27.8
15.....	29.8	56.3	26.5
16.....	31.6	57.1	25.5
17.....	32.0	56.6	24.6
18.....	30.7	55.0	24.3
19.....	29.8	53.9	24.1
20.....	28.4	52.5	24.1
21.....	26.3	50.7	24.4
22.....	24.7	49.6	24.9
23.....	21.7	47.3	25.6
24.....	19.1	45.7	26.6
25.....	19.2	46.5	27.3

* "Group accrual does not provide for the entire loss of short-lived components during their individual lives; the accrual must be carried out on the longer-lived components to the end of their lives and beyond the midpoint representing the average life of all components, in order to provide for the entire loss of the group as such." "The Straight-Line Depreciation Accounting Practice of Telephone Companies in the United States," in *Proceedings: International Congress on Accounting*, pages 382-383.

The deficiency in reserve between the average rate basis and the exhausted service life basis is substantial. It is also important to

note that even with a Group C account, the reserve ratio may exceed the 50 per cent. mark.

A similar comparison of a Group A account (computed on the same basis as the Group C account) shows that, although the deficiency in reserve is much smaller, the reserve ratio may substantially exceed the 50 per cent. point.

GROUP A ACCOUNT

RATIO OF RESERVE TO ASSET ACCOUNT

Year	Reserve Computed at Average Rate of 10 per cent.	Reserve Computed by Depreciating Each Com- ponent Over its Useful Life	Deficiency of Average Rate Method
1.....	5.0%	6.1%	1.1%
2.....	14.0	16.8	2.8
3.....	23.0	27.0	4.0
4.....	32.0	36.7	4.7
5.....	39.9	45.3	5.4
6.....	47.9	53.6	5.7
7.....	54.8	60.6	5.8
8.....	57.6	63.4	5.8
9.....	54.4	60.0	5.6
10.....	48.8	54.2	5.4
11.....	42.9	48.2	5.3
12.....	39.6	44.8	5.2
13.....	36.9	42.1	5.2
14.....	38.5	43.9	5.4
15.....	42.3	47.8	5.5
16.....	45.9	51.5	5.6
17.....	47.8	53.3	5.5
18.....	48.7	54.3	5.6
19.....	48.1	53.5	5.4
20.....	46.3	51.6	5.3

The deficiency in reserve is the smallest in a Group A account. The nearer the life curve approaches Curve D and/or the greater the rate of growth of the account, the greater the deficiency in reserve. After a certain point in the life history of an account, the deficiency has a tendency to decrease, but is not completely eliminated until all the components of the account are retired. The point at which the trend changes

and the manner of decrease in deficiency (either decreasing steadily or fluctuating narrowly or widely about a declining trend) are dependent upon the relationships of the various components of the individual account.

T. D. 4422 and Article 23(1)-5 of Regulations 94 provide:

"The capital sum to be recovered shall be charged off over the useful life of the property, either in equal annual installments or in accordance with any other recognized trade practice, such as an apportionment of the capital sum over units of production."

If the capital sum is recoverable "in equal annual installments," it follows that the correct reserve at any point of time is an amount equal to the pro-rated portion of the costs applicable to the exhausted or expired service life of the unretired components of the account. Thus the correct reserve is that corresponding to the exhaustion of service life and not one determined on the basis of average life.

The degree to which a reserve computed at the average rate differs from the real reserve (exhausted service life) depends upon the character of the account, its type of life curve, its rate of growth (or decline), whether its retirement experience comprises at least one complete or nearly complete life cycle, etc. It is not feasible, within the scope of this article, to illustrate the procedure of deter-

mining what the approximate reserve ratio should be.

The Treasury maintains that the depreciation rates determined from the retirement experience are subject to reduction if excessive depreciation was allowed in prior years, such excessive allowance being presumed from the status of the reserve ratio.

Inasmuch as the reserve ratios used as the criteria of measurement are predicated upon the average life and average depreciation rate theory of plant asset accounting, this tendency of the Treasury to reduce depreciation rates requires considerable modification with respect to the condition of the account at the time of its consideration. The extent of the modification is dependent upon the ratio of the actual allowed reserve and the relationships of the various components of the individual account.

In the determination of depreciation allowances, method is only a means to an end. Because the Treasury prefers the average life method of group depreciation accrual, it does not follow that a taxpayer in accepting such method for the purpose of reaching an agreement need also accept inadequate depreciation allowances because of the inherent defect in the averaging process. This method, or any other method, whether provided for in the Treasury Regulations or in the Treasury procedure, is only a means

to the end of allowing the taxpayer, as provided in the Revenue Acts:

"A reasonable allowance for the exhaustion, wear and tear of property used in the trade or business, including a reasonable allowance for obsolescence."

If the method has a defect which may operate against such "reasonable allowance," the method should be modified sufficiently in its application to compensate for such defect.

It is apparent that the determination of depreciation allowances has progressed a considerable distance during recent years. It is also apparent that the application of these procedures or technics requires Treasury personnel possessed of real ability and discretionary judgment. Fortunately, the Treasury has been able to secure such personnel.

Taxpayers' Procedure

It is evident that more care on the part of taxpayers is required both as to treatment of retirements on their records and the classification of depreciable assets.

Retirements:

Those taxpayers are at a very distinct disadvantage who have not kept a real plant asset depreciation and retirement accounting system, but have, in fact, "amortized a capital sum over a certain number

of years," and thus possess an inadequate record of their retirement experience. Their position may be improved by taking the older additions to their accounts and investigating the large units or the units comprising large amounts to determine whether or not they are still in use, their condition, expected remaining useful life, etc. It may even be advantageous to take a complete inventory of the existing plant assets and thus determine the aggregate retirements by comparison with gross additions to plant.

Inasmuch as under prior methods of depreciation, taxpayers ceased depreciating plant assets when fully depreciated and no particular liability arose if the fully depreciated assets remained on the books, it may prove desirable to investigate such fully depreciated amounts to determine whether they are still useful. The clearing from the accounts on the books of discarded items helps the taxpayer in giving him more retirement experience, and thus a shorter average life, and at the same time also improves the reserve ratio.

Grouping of depreciable assets:

Mim. 4170 provides:

"... the cost or other basis should be segregated into groups of accounts containing similar assets having approximately the same average lives..."

Some taxpayers have been grouping "similar assets" with very little attention to their average life, instead of grouping "similar assets having *approximately the same average lives.*" Grouping similar assets frequently results in including relatively large amounts representing long-lived assets, which adversely affects the average life of the group and causes inadequate depreciation for the short-lived assets included in the group.

In some cases such grouping includes long-lived assets with a large part of their useful life already exhausted and thus carrying a large accumulated depreciation reserve well in excess of 50 per cent. Including such items, which are not regularly replaced, causes a group to have a high reserve ratio and its adverse implications, when in fact the reserve may be correct.

If the "reasonable allowance" for depreciation to which a taxpayer is entitled can be substantiated under the forms required by the Treasury (and the technics and formulae developed by the Valuation Division), its allowance will be facilitated. However, even if the taxpayer's data do not conform to the Treasury requirements, if they are adequate to sustain the reasonableness of the depreciation claimed, it is generally possible to secure a fair settlement with the Treasury.

The L. R. B. & M. Journal

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The purpose of this journal is to communicate to every member of the staff and office plans and accomplishments of the firm; to provide a medium for the exchange of suggestions and ideas for improvement; to encourage and maintain a proper spirit of cooperation and interest, and to help in the solution of common problems.

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A Fortieth Anniversary Celebration

Last month The Pennsylvania Institute of Certified Public Accountants celebrated the fortieth anniversary of its organization (originally under the name of The Pennsylvania Association of Public Accountants) on March 30.

1897. At its founding it had fifteen members; today it has about six hundred members.

In March, 1899, Pennsylvania enacted the second CPA law in the country. Since that time almost twelve hundred Pennsylvania certificates have been issued.

These few facts and figures indicate in a limited way the tremen-

dous growth and development of our as yet young profession.

Our firm appreciates the privilege of having had its four founders among the charter members of the Pennsylvania Institute and of having had four of its members, Mr. Lybrand, Mr. T. Edward Ross, Mr. Adam A. Ross and Mr. Pugh, among those who have served as president of the Institute in the past.

At the fortieth anniversary celebration, Mr. Ross served as toastmaster; Colonel Montgomery, as president of the American Institute of Accountants, and Mr. Lybrand were among the speakers.

Mr. Fischer, chairman of the Philadelphia Chapter of the Institute, incorporated in his toast to the five living charter members the following poem written by Mr. Walton H. Troyer of our Philadelphia staff:

A toast to the five now living,—
I've thought of that with misgiving,
For what can I say
To this famous array
That won't make you think I am fibbing.

You stood at high desks, all day long,
And yet, when night came, a song
Played on your tongues.
You traveled often by caboose,
But hardships could not pry you loose
From climbing up the ladder's rungs.

No schools or books were helpful then,
You had to write them with your pen,
The vouchers, invoices and bills,
Were filed on sticks on window sills,
And distribution made by men.

You wrote the books, you taught the young,

Accountants met, and thus begun
Societies, such as our own,
And we *all* know, how they have grown.

Our "account" with you cannot be paid,
Just "charge it off," for we're dismayed
At our "indebtedness."

Your work for us has been "reviewed,"
We find no "liability accrued,"
You've "prepaid" our success.

We wish you happiness in living,
I've thought of that with no misgiving
For you have finished your "commission"

"Consolidating" our position.

Celebrations of this kind serve a useful purpose. They are a fitting tribute to those who labored in "the day of small things" and who see the remarkable development which has occurred, and they are an inspiration to the younger men in the profession to make their contribution of time, thought and effort to the profession of which they are a part.

The Natural Business Year

The Natural Business Year Council is continuing its helpful activities in bringing to the attention of business and professional men the advantages of the use of the natural business year where for any given enterprise or industry it differs from the calendar year.

The natural business year is defined by the Council as follows:

The natural business year of an enterprise is the period of twelve con-

secutive months which ends when the business activities of the enterprise have reached the lowest point in their annual cycle. In the interests of economy and efficiency, the natural business year of an enterprise should be adopted as its fiscal year.

The Council has recently issued three pamphlets, one setting forth the advantages of the natural business year to business management, another describing the manner in which the natural business year can be a means to efficiency, and the other giving a list of suggested natural fiscal closing dates for various industries.

These pamphlets should prove of considerable interest, not only to our own organization but also to those of our clients who are using the calendar year for their accounts, but where the conditions of the industry in which they are engaged would appear to be such that the natural business year ends with some other date than December 31.

Deferred Charges and Prepaid Expenses

In a series of articles in *The Certified Public Accountant*, under the general title of "Seen in Published Financial Statements," W. T. Sunley, C. P. A., commented as follows on Deferred Charges and Prepaid Expenses:

Are These Items Assets? The question not infrequently arises as to whether these items are assets and are properly

included under that caption on the balance sheet. . . .

It must be admitted that many deferred charges and prepaid expenses have no value realizable in cash. Some carry a right to receive future service, others have not even that status. . . .

Some of the best material Montgomery ever turned out is on this subject:

"The term 'good accounting practice' is not wholly a technical expression; it is an inclusive term and comprehends moral as well as business practices. A corporation may start with a cash-paid-in capital of \$1,000,000. Pursuant to a well-defined plan it may expend most of the capital in development expenses during the first year or two. At the end of the third year its balance sheet may show either a large deficit or deferred charges, depending on the method of bookkeeping. If a deficit is shown, stockholders may be discouraged and sell out their stock at a loss. The favored few who realize that the balance sheet does not correctly state the condition of the corporation may buy this stock at much less than it is actually worth. During the fourth year large profits are shown to have been earned, because there are no deferred expenses to be charged off. The stock goes up and those who are fortunate enough to know that the books misrepresented actual conditions will reap the benefit. The balance sheet showing the large deficit and the later income account showing the increased profit were both incorrect.

"The foregoing comments must be restricted to expenditures which clearly aid or which are intended to aid subsequent periods. From the standpoint of good accounting practice, there is no option of how the items shall be charged. The function of accounting is to portray in a scientific manner the financial condition of a business. If ex-

penses are incurred in a single year or during a few years, and if those expenses are incurred wholly for the purpose of increasing profits in future years, such expenses are clearly in the nature of an investment. If they are charged off as expenses in the year they are incurred, the current book profits are smaller and the subsequent book profits are greater than is actually the case, and the real purpose of keeping the books is defeated; the books do not present the real condition of the business. Charging such expenditures to periods which cannot realize the benefits is bad accounting practice." (*Auditing Theory and Practice*, 5th Ed., p. 287.)

A Philosophy of Depreciation

The well-done review of Porter and Fiske's book, *Accounting*, by Mr. W. H. Lawton, which appeared in the *Journal of Accountancy*, contained the following statement:

Emphasis is rightly laid upon the conception of fixed assets as really prepaid expense, depreciation recording what has been consumed during the period. This is more fully treated in the next part. Much confusion in the student and public mind would be

avoided if this philosophy of depreciation were better understood.

The opening paragraph of an article by Mr. Staub on Deferred Charges to Operating, which appeared in the *Journal of Accountancy* twenty-six years earlier, read as follows:

In addition to the items appearing in a balance sheet under the caption, Deferred Charges to Operating, others not usually so indicated, such as machinery and most of the other component parts of plant, inventories of manufactured or partially finished product, materials and supplies—as well as indirectly reserves for depreciation and renewals—items often of considerable magnitude, come just as surely under this general classification as the items usually so designated. In fact, almost all the assets of manufacturing, transportation or public service undertakings which have not had their financial status fixed beyond the probability of being influenced by future operations, meaning by this latter class such assets as cash and receivables, are in reality but deferred charges to operating.

It is interesting to note the similarity of thought expressed in these statements which were made more than a quarter century apart.

Notes

Colonel Montgomery was one of the speakers at the April meeting of the New York State Society of Certified Public Accountants which was devoted to the general subject of Education for Accountancy, Past, Present, and Future. The Colonel's topic was "Four Decades in Education for Accountancy."

On April 6, Mr. Staub spoke over Station WEAf of the National Broadcasting Company on "How to Prepare Your New York State Income Tax Return." The broadcast was under the auspices of the New York Chapter of the National Association of Cost Accountants.

At the Spring Conference of Controllors, held at the Waldorf-Astoria Hotel in New York City on April 29, under the auspices of the Controllors Institute of America, Mr. Staub was the discussion leader of a round table group to consider the "Effect of Federal Tax Laws on Corporation Policies" and Mr. W. H. Davidson, of our New York staff, was the discussion leader of a round table group considering "Recent Decisions on Federal Tax Laws and Regulations."

In General Hugh Johnson's column in the New York *World Telegram* he expressed some thoughts on April 26 regarding a

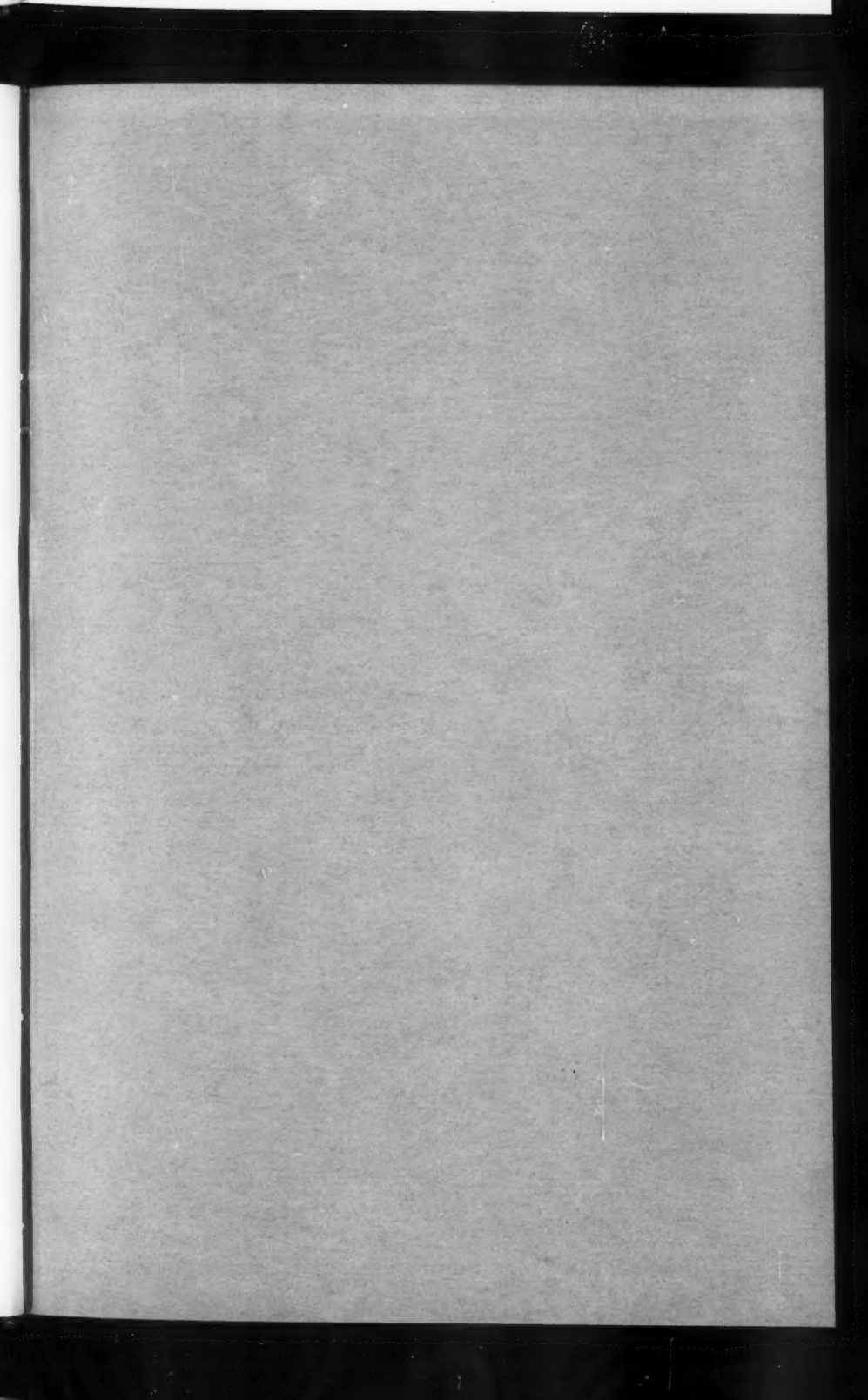
study and revision of our national system of taxation. The following paragraph included in his remarks was of particular interest to our organization:

This is a technical subject in a desperate case—almost as delicate as a surgical operation on the human heart. There are in this country experts on the subject of taxation—for example, Robert H. Montgomery, who is generally regarded among other specialists in the light that the Doctors Mayo were regarded among surgeons.

The dinner of the Pennsylvania Institute of Certified Public Accountants at the Bellevue-Stratford Hotel in Philadelphia on April 6, in celebration of the fortieth anniversary of the founding of the first organization of professional accountants in Pennsylvania was attended by all our Philadelphia partners and by a number of members of our Philadelphia staff, and by Messrs. Lybrand, Montgomery, Staub and Keast from out of town.

Mr. Fischer was co-chairman of the Accountants Division of the Firms & Employees Committee of the recent United Campaign for contributions to The Community Fund of Philadelphia and the Federation of Jewish Charities for 1937.

Mr. C. G. Wood of the Rockford Office staff has passed the Illinois C. P. A. examination.



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